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23456	7590	02/07/2006	EXAMINER	
WADDEY & PATTERSON 1600 DIVISION STREET, SUITE 500 NASHVILLE, TN 37203			DANIELS, MATTHEW J	
			ART UNIT	PAPER NUMBER
			1732	
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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/720,841

Applicant(s)

HUANG ET AL.

Examiner

Matthew J. Daniels

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-18 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/27/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, Claims 1-12 and 19 in the reply filed on 25 January 2006 is acknowledged. The traversal is on the ground(s) that the election of species does not establish how Claim 1 is not generic to the claims of Species II and Species II is simply the generic process of Species I with an added step, and not an independent and distinct species. The species restriction requirement was set forth on the basis of the order of incorporating the friction additive. The Applicant's argument is not found to be persuasive because different methods of introducing the friction additive would be required to introduce the friction additive into the mixture for subsequent compression (Claim 19, for example) and impregnating the friction additive into the compressed preform (Claim 20, for example). This is not interpreted to be just an added step, but a rearrangement of the claimed steps that would change the claimed process.

The requirement is still deemed proper and is therefore made FINAL.

### ***Information Disclosure Statement***

2. Document EP 1323685 (Bauer) was cited on the PTO-1449 filed 27 February 2004 in a list with U.S. Patents citations. 37 CFR 1.98(a)(1) states that "U.S. patents and U.S. patent application publications must be listed in a section separately from citations of other documents." In order to ensure proper listing, this reference has been listed on the PTO-892 enclosed with this action. A copy of the reference has also been provided with this action.

### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. **Claims 1, 6-12, and 19** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,699,427 in view of Kalnins (USPN 4252513).

#### Claim 1 of the instant application over Claim 1 of the ‘427 Patent

Instant Claim 1 and Claim 1 of the ‘427 patent are drawn to carbon-containing fibers and a carbonizable matrix, heating by application of electrical current, and the claimed pressure of 35 kilograms per square centimeter. The instant application is silent to removing volatile components, however, Claim 7 is directed to 500 C, which would obviously remove at least some volatile components from the mixture. The ‘427 patent is silent to the friction additive. However, such additives are common, as taught by Kalnins (4:45-50). It would have been prima

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facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of the '427 patent because such friction modifiers are commonly used, and because they would help increase the lifetime of the component.

Claims 6-12 of the instant application over Claims 2, 4, 8, 9, 13, 19 of the '427 patent

The following claims are substantial duplicates, and are therefore obvious by dependence for the same reasons set forth above.

As to Claim 6, See Huang's Claim 19, column 12.

As to Claim 7, See Huang's Claim 2, column 11.

As to Claim 8, See Huang's Claim 4, column 11.

As to Claim 9, See Huang's Claim 8, column 12.

As to Claim 10, See Huang's Claim 9, column 12

As to Claim 11, See Huang's Claim 13, column 12 and silica (Kalnins)

As to Claim 12, See Huang's Claim 19, column 12

Claim 19 of the instant application over Claim 22 of the '427 patent

Both Claims are drawn to a mixture of pitch and carbon fibers, applying a current to reach 500 C, introducing a carbonizable material into the compressed preform, optionally baking and repeating the introduction of carbonizable material, and graphitizing to reach a density greater than 1.7. The instant application is silent to removing volatile components, however, Claim 19 also includes the condition of heating to 500 C, which would obviously remove at least some volatile components from the mixture. The '427 patent is silent to the friction additive. However, such additives are common, as taught by Kalnins (4:45-50). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the

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method of Kalnins into that of the '427 patent because such friction modifiers are commonly used, and because they would help increase the lifetime of the component.

4. **Claims 1, 6, and 7** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, and 7 of U.S. Patent No. 6878331.

Claims 1, 6, and 7 of the instant application over Claims 1, 2, and 7 of the '331 Patent

Instant Claim 1 and Claim 1 of the '331 patent are drawn to mixing a material with a carbonizable matrix material, heating to melt the matrix material, applying an electric current, applying a pressure of 35 kg per square cm. Instant claim 1 is silent to the reimpregnating to achieve a density of 1.3 or higher. However, these aspects are claimed in the instant application in Claims 6 and 7. The '331 patent is silent to carbon fibers and friction additives, but these aspects are subsequently claimed in Claims 2 and 7, respectively.

It should also be noted that USPN 6878331 has the same effective filing date as the instant application and a later publication date, and therefore does not appear to qualify as prior art under either 35 USC 102(a) or 102(e).

5. **Claims 1, 6, 7, and 19** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 7 of copending Application No. 10/720,833.

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Claims 1, 6, 7, and 19 of the instant application over Claims 1 and 7 of Application No. 10/720,833

Instant Claim 1 and Claim 1 of the '833 application are drawn to mixing carbon-containing fibers with a carbonizable matrix, heating to a sufficient temperature to melt the matrix by applying an electrical current, and applying a pressure of at least 35 kilograms per cubic centimeter. The instant application appears to be silent to increasing the density by introducing a carbonizable material into voids to achieve a density of 1.30, and impregnating further with a treating component. However, impregnation and the claimed density are found in the instant application in Claims 6 and 7. Impregnating further with a treating component is sought in instant Claim 19 (steps c, d, e). Claim 1 of the '833 application appears to be silent to the friction additive, however, this aspect is subsequently claimed in claim 7 of the '833 application.

This is a provisional obviousness-type double patenting rejection.

6. It should also be noted that USPN 6803108 and applications 10/832,098 and 11/115,551 have also been considered for nonstatutory obviousness-type double patenting.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 1, 2, 6-12 and 19** are rejected under 35 U.S.C. 102(e) as being anticipated by Huang (USPN 6699427).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

**As to Claim 1**, Huang teaches a method of forming a composite material comprising: combining carbon-containing fibers (4:55-60), a carbonizable matrix material (5:46-6:15), and a friction additive to form a mixture (4:60-68);

heating the mixture to a sufficient temperature to melt a portion of the matrix material (Claim 1, column 11), the step of heating including:

applying an electric current to the mixture to generate heat within the mixture (Claim 1, column 11); and

while heating the mixture, applying a pressure of at least 35 kg/cm<sup>2</sup> to the mixture to form a compressed composite material (Claim 1, column 11).

As to Claim 2, graphitized carbon (4:65) is interpreted to be isotropic coke.

As to Claim 6, See Huang’s Claim 19, column 12.

As to Claim 7, See Huang’s Claim 2, column 11.

As to Claim 8, See Huang’s Claim 4, column 11.



As to Claim 9, See Huang's Claim 8, column 12.

As to Claim 10, See Huang's Claim 9, column 12

As to Claim 11, See graphitized carbon (4:65), and Claim 13, column 12

As to Claim 12, See Claim 19, column 12

As to Claim 19, See Claim 22 and graphitized carbon (4:65), which is interpreted to be isotropic coke.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 2, 3, 4, and 19** are rejected under 35 U.S.C. 103(a) as being obvious over Huang (USPN 6699427), in view of Kalnins (USPN 4252513).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the

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application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Huang teaches the subject matter of Claim 1 above under 35 USC 102(e). **As to Claims 2, 3, and 4**, Kalnins also teaches that silica powder, among other substances which comprise either isotropic coke or an oxide of silicon listed in (4:35-5:10), are “commonly used friction modifiers” (4:47). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of Huang in order to modify the friction characteristics or increase the stopping power or lifetime of the brake (Kalnins 2:55-56). **As to Claim 19**, in the event that graphitized carbon cannot be considered to be isotropic coke (See the rejection of Claim 19 above under 35 USC 102(e)), the Examiner submits that friction additives including at least one of an oxide would have been prima facie obvious at the time of the invention. Huang teaches substantially all of the subject matter of instant Claim 19 in Claim 22 of the ‘427 patent (columns 12-14), and Kalnins additionally teaches that silica powder, among other substances which comprise either isotropic coke or an oxide of silicon listed in (4:35-5:10), are “commonly used friction modifiers” (4:47). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of Huang in order to modify the friction characteristics or increase the stopping power or lifetime of the brake (Kalnins 2:55-56).

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9. **Claims 1-4 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalnins (USPN 4252513). As to Claim 1, Kalnins teaches a method of forming a composite material comprising:

combining carbon-containing fibers (5:5), a carbonizable matrix material (4:55-60), and a friction additive to form a mixture (4:48);

heating the mixture to a sufficient temperature to mold a portion of the matrix material (2:20-24, 3:15-20), the step of heating including:

applying an electric current to the mixture to generate heat within the mixture (3:60-4:3, column 2); and

while heating the mixture, applying a pressure of at least 35 kg/cm<sup>2</sup> to the mixture to form a compressed composite material (2:48-52, the claimed pressure is approximately 500 psi).

Kalnins appears to be silent to heating the mixture to “melt” at least a portion of the matrix material. However, because the heating facilitates “flow” of the material into cavities (2:42), it is submitted that melting of the matrix resin would have been obvious or inherent. As to **Claims 2-4**, Kalnins teaches at least silica (4:45-48). As to **Claim 11**, Kalnins teaches 20-77 wt.% carbon-containing fibers with 20-50wt.% carbonizable matrix material, and 3-30% of the additive (4:35-5:5).

10. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalnins (USPN 4252513) in view of Shaver (USPN 4444894) and Ho (USPN 5037626). Kalnins teaches the subject matter of Claim 2 above under 35 USC 103(a). As to **Claim 5**, Kalnins is silent to converting the disclosed oxide (silica) to a carbide by heat treating the compressed composite

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material at an elevated sufficient temperature. However, Kalnins teaches mixing of a phenolic resin with silica (4:58 and 4:48), which Shaver also teaches (1:55-67). Ho provides motivation for one of ordinary skill in the art to make the combination because silicon carbide is a high strength material having good chemical stability, excellent oxidation resistance, and because the mixture of a carbonizable matrix and silica (2:10-28) can induce a reaction which produces a relatively large proportion of silicon carbide whiskers (2:24-28), which are a much more effective reinforcement in composites than particulates (1:18-20).

11. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalnins (USPN 4252513) in view of Shaver (USPN 4444894) and Ho (USPN 5037626), and further in view of Niwa (USPN 5525558). Kalnins, Shaver, and Ho teach the subject matter of Claim 5 above under 35 USC 103(a). **As to Claim 6**, the cited references appear to be silent to impregnating the compressed composite with a carbonizable material. However, Niwa teaches impregnating after forming the composite by introducing a resin or pitch into the pores (8:57-9:24). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Niwa into that of Kalnins, Shaver, and Ho because Niwa teaches that in order to improve the wear resistance, the impregnating (densifying) treatment is repeated such that the final porosity is preferably not more than 10% (9:17-24), which Niwa appears to achieve (13:48)

12. **Claims 7 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalnins (USPN 4252513) in view of Hatch (USPN 4166145). Kalnins teaches the subject matter of

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Claim 1 above under 35 USC 103(a). **As to Claim 7**, Kalnins is silent to the claimed conditions and achieved result. However, Hatch teaches that it is known to heat a mixture to a temperature of at least 500 C (2:45-3:14) to form a compressed composite having a density of at least 1.3 grams per cubic centimeter (Column 12, Table 1). Hatch appears to be silent to the claimed thirty minutes. However, Hatch clearly teaches that temperature ramp and time clearly represent result effective variables (5:16-19, 6:12-17, 6:23-37). In view of Hatch's teachings, and in view of Kalnins' teaching that the internal heating method produces the benefits of uniform heating (1:33-34) and reduced the time scale (1:58-60), one of ordinary skill would have found it prima facie obvious to optimize the heating time. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hatch into that of Kalnins because Kalnins suggests brakes (2:56), which Hatch provides (1:20), Kalnins suggests phenolic resins (4:55-60), which Hatch provides (4:37), and because doing so would produce a dense composite having desirable properties including high temperature oxidation resistance (1:15-17). **As to Claim 10**, Hatch provides a two-step heating process, which comprises a first heating step at a first temperature (5:51-6:22), and a second heating step at a second temperature higher than the first (5:51-7:44). In the combined method incorporating the method of Kalnins, it would have been prima facie obvious to one of ordinary skill in the art that a second and higher power level would have been required in order to raise the temperature of the mixture to the degree required by Hatch's method.

13. **Claims 8 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalnins (USPN 4252513) in view of Klett (USPN 5744075). Kalnins teaches the subject matter of Claim

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1 above under 35 USC 103(a). **As to Claims 8 and 9**, Kalnins is silent to powdered pitch and polyacrylonitrile carbon fibers. However, Klett teaches both powdered pitch (4:59-65) and polyacrylonitrile carbon fibers (4:59-65). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Klett into Kalnins because Klett provides a composition for brakes (2:5), which Kalnins suggests (2:56) and because Klett's method provides enhanced thermal conductivity and improved friction and wear properties (3:61-65).

14. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalnins (USPN 4252513) in view of Prevorsek (USPN 5556704). Kalnins teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 12**, Kalnins appears to be silent to increasing the density by introducing a carbonizable material into voids in the compressed composite and then backing to achieve a density of at least 1.6 grams per cubic centimeter. However, reimpregnation is common in the art, and Prevorsek teaches this aspect (4:5-13). Without reimpregnation, Prevorsek teaches that it is possible to densify composites to produce a density of 2.0 grams per cubic centimeter (1:45-49). Therefore, when re-impregnating (4:5-13), it appears obvious that one of ordinary skill would have expected to achieve densities greater than the claimed 1.6 grams per cubic centimeter. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Prevorsek into that of Kalnins in order to minimize cracking (2:30-35), increase the density of the resulting product, and improve the oxidation resistance.

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15. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatch (USPN 4166145) in view of Kalnins (USPN 4252513). As to **Claim 19**, Hatch teaches a method of forming a composite material suitable for vehicle brakes comprising the steps of:

- a) compressing a mixture of carbon fibers (4:27-29), a matrix material which includes pitch (4:34-38), and a friction additive (4:30-31),
- b) during the step of compressing, the mixture reaches a temperature of at least 500 degrees C to form a compressed preform (3:10-22, 5:51-68);
- c) introducing a carbonizable material into the compressed preform to form an impregnated preform (1:54-56);
- d) optionally, baking the product of step c) to carbonize the carbonizable material (1:54-56);
- e) optionally repeating step c) and step d) (1:54-56); and
- f) graphitizing the impregnated preform to a final temperature of at least about 1500 degrees C to form the composite material (columns 6 and 7), the graphitized preform having a density of at least about 1.7 grams per cubic centimeter if step c) is repeated no more than once (See “Final Density” in Table II, Column 13).

Hatch is silent to the following aspects of the Applicant’s invention:

- a) the additive comprises at least one of a carbide, an oxide, isotropic coke, and combinations thereof;
- b) applying a current to the mixture, the mixture providing a sufficient electrical resistance to the current such that the mixture reaches the claimed elevated temperature.

However, these aspects would have been prima facie obvious over Kalnins for the following reasons:

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a) Firstly, Hatch teaches asbestos (4:31), which is a silicate, and therefore comprises at least an oxide. However, Kalnins teaches silica, or silicon oxide, as a commonly used friction modifier (4:45-48).

b) Secondly, Kalnins teaches passing an electric current through the mixture (1:47-3:19) to reach temperatures of 500 C (2:41).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of Hatch because doing so Kalnins resolves the problem of nonuniform heating of the resin due to poor heat conducting characteristics (1:25-30), and additionally because doing so enables the time scale for heating to be reduced (1:58-60).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 7:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJD 1/31/06



**MICHAEL P. COLAIANNI**  
**SUPERVISORY PATENT EXAMINER**